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# A NEW HOPLOPHONEUS FROM THE TITANOTHERIUM BEDS.

INVESTIGATION AIDED BY A GRANT FROM THE MARSH FUND OF THE  
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(Read April 22, 1921.)

Comparatively little prospecting was done by the Princeton 1920 expedition to South Dakota in the Titanotherium beds, but as a by-product of some studies on the contact between this formation and the Oreodon beds the specimen described herewith was found, which is interesting both as the oldest representative of the genus *Hoplophoneus* and as a higher type of specialization in the development of the chin flange than is found in the various species of this saber-tooth from the Oreodon beds. If *Hoplophoneus mentalis* is ancestral to *Eusmilus dakotensis* from the Protoceras beds, as seems possible, perhaps we have here an illustration of a case of survival of the fittest adaptation, with dying out of the shorter-chinned mutants of the Oreodon beds, in which less adequate protection was afforded by the chin flange to the long upper saber-teeth.

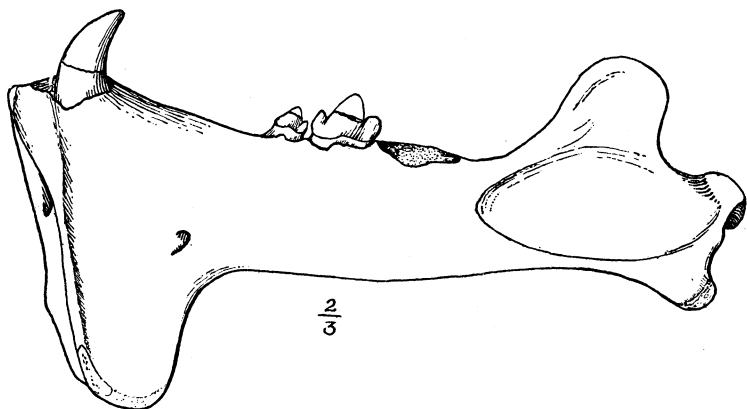


FIG. 1. *Hoplophoneus mentalis*, type specimen, side view of the left half of the lower jaw, two thirds natural size, No. 12515.

## HOPLOPHONEUS MENTALIS sp. nov.

Type No. 12515, Princeton University Geological Museum, collecting locality 1015A1, left ramus of the lower jaw with the canine and third and fourth premolars in place (Fig. 1), secured by the 1920 South Dakota expedition from the uppermost levels of the Titanotherium beds (Chadron formation), two to two and one half feet below the thin local bed of white limestone at the contact between the Chadron and Brule formations (Oreodon beds), and two and a half to three feet above titanother bones in place, in the valley of Indian Creek, near Taylor's ranch, west of Hart Table in Pennington County (locality shown in Fig. 2 of Plate 1 of the preceding paper, in about the center of the picture).

## MEASUREMENTS.

|   | <i>H. occidentalis</i> <sup>1</sup> | <i>H. mentalis</i> ,<br>No.<br>12515. | <i>H. insolens</i> ,<br>No.<br>11372. <sup>2</sup> | <i>H. robustus</i> ,<br>No.<br>10647. <sup>2</sup> |
|---|-------------------------------------|---------------------------------------|--|--|
| Depth of chin at flange.....  | 80 mm.                              | 67 mm.                                | 52 mm.   | 54 mm.   |
| "    "    ramus at p <sub>3</sub> .....                             | 32                                  | 25.5                                  | 26   | 26   |
| "    "    "    "    m <sub>1</sub> .....                            | 31                                  | 26.5                                  | 26   | 26   |
| Length of ramus.....  | 164                                 | 145                                   | 138  | 134.5  |
| Height at coronoid.....   | 50                                  | 43                                    |  | 39   |
| Width of lower canine at base of crown..                            | 13                                  | 6                                     | 6  | 6  |
| Length p <sub>3</sub> .....   | 12                                  | 6.5                                   | 8  | 6.5  |
| "    p <sub>4</sub> .....   | 17                                  | 12.75                                 | 14   | 13.5   |
| "    m <sub>1</sub> .....   | 22                                  | 17.5                                  | 14.5   | 16.5   |
| Diastema c-p <sub>3</sub> .....                                     | 42                                  | 33                                    | 33   | 30.5   |
| Anterior margin of masseteric fossa to<br>canine ridge, length..... | 100                                 | 80                                    | 79   | 74.5   |

So far as I am aware, this is the first *Hoplophoneus* to be described from the Titanotherium beds and is strikingly differentiated from all of the species of the overlying Oreodon beds by the extraordinary depth of the chin (as suggested in the specific name proposed), a character reminiscent of the great development of this structure in Hatcher's *Eusmilus dakotensis* from the Protoceras beds, to which the new form seems to be transitional.

<sup>1</sup> Williston's measurements, *Kansas Univ. Quarterly*, Vol. III., No. 3, p. 72, 1895.

<sup>2</sup> Specimens in the Princeton Geological Museum used by G. I. Adams, in defining these species.

From the table of measurements it will readily be seen that *Hoplophoneus mentalis* is considerably smaller than the large *H. occidentalis*, approximating in size individuals of the *insolens* and *robustus* groups. A comparison with the specimens in the Princeton collection used by Adams in defining these two forms shows that, although the jaw depth back of the flange is the same in *H. robustus* and *H. insolens* as in the new form, the flange is absolutely larger in the latter and tapers less rapidly in width distally; both premolars are smaller, and in  $p\bar{4}$  the paraconid is disproportionately smaller, than in *H. insolens* (Princeton Univ. Geol. Mus. No. 11372) and is out of line with the other two cusps, toward the inner side of the jaw as in *Eusmilus* and hoplophonids in general, and has sharper cutting edges than in *H. insolens*; also the alveolus for  $m\bar{1}$  is very much wider transversely, in front, than in the latter species. Between *H. robustus* and *H. mentalis* there is the same striking difference in the shape of the jaw flange, which is decidedly V-shaped in *robustus*, while in the new species it is U-shaped and of the *Eusmilus* type. The third premolar is as small as in *robustus*, but rakes backward a bit stronger and has a larger posterior cuspule. To the paraconid of  $p\bar{4}$  the same remarks are applicable as in the comparison with *H. insolens*.